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Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE STRIKING AT PIER 14, HAMILTON HARBOUR, ONTARIO, BY THE PANAMANIAN VESSEL "NORTHERN CHERRY", MAY 14, 1986.

REPORT No. 443

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE STRIKING AT PIER 14, HAMILTON HARBOUR, ONTARIO, BY THE PANAMANIAN VESSEL "NORTHERN CHERRY", MAY 14, 1986.

Particulars of vessel

Name	"NORTHERN CHERRY" (ex "LYNTON GRANGE")
Official Number	12539-82B
Port of Registry	Panama
Call Sign	HPLX
Gross Tonnage	14,760
Net Tonnage	11,061
Deadweight	26,541 t
Length OA	183.02 m
Breadth	22.75 m
Depth	13.33 m
Summer Draught	10.47 m
Draught, at time of incident	F: 7.85 m A: 8.18 m
Type	Bulk Carrier
Built	1976, Austin & Pickersgill Ltd, England
Propulsion	6 cylinder Sulzer diesel, 9,900 b.h.p., Hawthorn Leslie (Engineers) Ltd.
Classification	NKK (Nippon Kaiji Kyokai)
Owner	Central Shipping (Holdings) Inc. Panama
Operator	Island Navigation Corp. Ltd., Hong Kong

NOTE - All times in this report are expressed in Eastern Daylight Saving Time (UTC minus 4 hours).

Background

The bulk carrier "NORTHERN CHERRY", originally named "LYNTON GRANGE", was built in 1976 by Austin & Pickersgill, Ltd., Sunderland, England. She was classified by Lloyd's Register of Shipping, but since 1982 she had been withdrawn from the Society at the new owner's request and classed with NKK (class sample NS-BC-SHC 246E MS).

The vessel has 7 cargo holds and 7 double bottom tanks, and has a total deadweight of 26,541 t. The cargo spaces are all located forward of the bridge and accommodation. The vessel is powered by a 6 cylinder Sulzer diesel engine that generates 9,900 b.h.p. and gives a maximum speed of 13.8 knots. Her normal run is between North America and Europe.

The "NORTHERN CHERRY" is equipped with 2 Decca radars, Decca Loran C, Kelvin Hughes echo sounder, Microtecnica gyro with 4 repeaters, Decca autopilot, ITT marine VHF radio and W/T Transmitter & Receiver.

On May 14, 1986, while berthing at pier 14 in Hamilton harbour, the vessel struck the wharf and sustained heavy damage to her bow. However, there were no injuries nor was there any pollution as a result of this incident.

Narrative

The "NORTHERN CHERRY" departed Tampa, USA, May 1, 1986, with a load of 20,607 t of phosphate, bound for Hamilton, Ontario. She reached Montreal, Quebec, on May 10, where she discharged 4,500 t of her cargo in order to meet the required draught for the St. Lawrence Seaway.

At 1200, May 13, the vessel sailed from Montreal for Hamilton, Ontario. Her draughts were 7.85 m forward and 8.18 m aft. The voyage through the Seaway was uneventful. The final leg of her voyage from Cape Vincent to Hamilton was under the conduct of an American Great Lakes pilot who boarded the vessel at 1100, May 14, 1986.

At 2220, May 14, the vessel arrived at the fairway buoy "A" off Hamilton harbour, and the crew were on 'stand-by' at their manoeuvring stations. The weather conditions were overcast with slight wind from the north, temperature 10°C, slight sea and the visibility was 8 miles or more.

On the bridge, there were the pilot, who assumed the conduct of the vessel, the ship's master, the OOW and the helmsman. The vessel then proceeded into the Burlington

canal at 2230, passed under the lift bridge and cleared the "Jane & Allen" skyway at 2240. She then proceeded toward the slip between pier 12 and pier 14 in Hamilton harbour; berthing was to take place with the assistance of two tugs, the "STORMONT" (680 b.h.p.)and the "GLENEVIS" (900 b.h.p.). The average approaching speed of the vessel was about 4 knots with a series of engine orders of 'dead slow ahead' and 'stop'. Orders were being given by bridge telegraph and control of the engine was in the engine-room.

Communication between the pilot and tugs was made on VHF channel 10, and the two tugs which had been standing by at pier 11 came alongside the vessel. The "STORMONT" was assigned by the pilot to stand-by on the ship's starboard bow and the "GLENEVIS" on the starboard quarter. Both tugs reported in position when the vessel was about a ship's length from her berth. The pilot intended to use the tugs to push the vessel alongside the wharf; therefore, neither of the tugs was made fast to the vessel.

At 2334, when the "NORTHERN CHERRY" was nearly alongside her berth, the ship's engine was ordered to 'slow astern', then 'half astern' and 'full astern' but the vessel continued to move forward without any sign of slowing down. The ship's engine did not start to go astern. When the striking with the wharf became imminent, the starboard anchor was ordered let go with one shackle of cable. The tug "STORMONT", which was notified of the anchor work, moved away from the bow and the anchor was let go. After dropping the anchor, the vessel sheared to starboard and the tug was ordered to push on the vessel's bow in order to bring her parallel to the wharf. Very shortly thereafter, the "NORTHERN CHERRY" ran into the wall at the end of the slip.

The time was 2339, May 14, 1986. The vessel was then lying stopped with more than 2 m of the bow pushed back by the wharf, the latter being of concrete construction. The damaged bow overhung the wharf and the vessel was unable to get clear.

In an attempt to free the vessel, the ship's towlines from the starboard quarter were passed to each tug and both tugs were ordered to pull the vessel astern at various angles. Two stern lines were also made fast to shore and were hove-up with the winches.

At about 0130, May 15, the ship's engine could be restarted to give astern power again and both tugs were also ordered to increase to full power. The vessel then moved astern slowly but she was not finally freed until about 0515.

She was eventually towed alongside the assigned berth and was secured in position at about 0600, without using the ship's engine, which failed to go astern again at 0538. When berthed, all holds and tanks were sounded. The vessel sustained heavy damage to the bow and the forepeak was found to be flooded to the waterline. However, no other apparent damage was detected and no oil leakage was observed during, or subsequent to, the striking of the wharf.

Following the casualty, the vessel's draughts became 8.25 m forward and 7.99 m aft.

The incident was afterwards reported to the owners and to the Canadian Coast Guard by the ship's master shortly after docking. The pilot left the vessel shortly after she was secured in position at her assigned berth.

Analysis

1. Language of Communication

The Panamanian bulk carrier "NORTHERN CHERRY" was manned by a Korean crew. Their working language aboard was Korean but the bridge personnel understood English and the pilot had no difficulty in communicating with them.

2. Pilotage

Pilotage for Lake Ontario and its harbours are administered jointly by the Great Lakes Pilotage Authority and the United States Coast Guard, and all ships over 300 gross registered tons, except Canadian and United States regular traders, must have a pilot on board for these waters, unless there is a member of the ship's complement who is the holder of a Great Lakes Navigation certificate issued by the Canadian Coast Guard.

3. Status of Navigational Equipment

Prior to the incident, it was reported that all of the navigational equipment and machinery aboard the "NORTHERN CHERRY" was working properly to the satisfaction of the pilot.

4. Main Engine

The main engine of the "NORTHERN CHERRY" is a 6 cylinder Sulzer diesel engine type GRND68, generating 9,900 b.h.p. and activating a right-handed propeller which gives a maximum speed of 13.8 knots. The engine is

started by compressed air at a pressure of 16 to 21 kg/cm^2. The vessel is equipped with 3 air compressors, one of which had been out of order for some time. The two others were in working condition. Reportedly, these two air compressors took 55 minutes to fill the air receiver to maximum. This was longer than the usual 30 to 35 minutes necessary when all three were in good working condition.

It was reported that the minimum air pressure necessary to start the main engine was $14.5kg/cm^2$ and the main engine could have 13 starts from maximum air pressure of a full receiver, without recharging. The master was aware of the general limitations afforded by the loss of one air compressor, but the pilot was not aware of this limitation.

5. Hamilton Harbour

Hamilton harbour is separated from Lake Ontario by a natural sand barrier through which the Burlington Canal has been cut and dredged to a depth of 8.80 m. Access to the harbour is through the Burlington Canal which is 91 m wide. There are 2 bridges across the Burlington Canal: the combined highway and railway vertical lift bridge, and the Skyway Arch bridge.

The assigned berth of the "NORTHERN CHERRY" was in the slip between pier 12 and pier 14 which was about 2 miles distant from the inner end of the Burlington Canal. The slip is 380 m in length and 90 m wide and is marked at the entrance by 2 flashing red and green lights. The slip offers an 8.2 m depth of water.

6. Weather

At the time of the incident, the weather was clear with a slight wind from the north. The water was calm and the visibility was about 8 miles.

7. Final Approach to Berth

The "NORTHERN CHERRY" made her final approach in 30 minutes between 2303 and 2333, over a distance of 2 miles. Her average speed of approach was 4 knots. During this period, 7 engine orders 'dead slow ahead' and 7 'stop' were given. The number of engine orders indicated a cautious approach under the good weather conditions. However, at the time of the incident, the air pressure in the air receiver read 16 kg/cm^2 which was still higher than the minimum air pressure required

to start the engine.

Referring to the 'deck log book' and the 'bridge bell book', there is no mention of the main engine being tested for ahead/astern movement prior to entry into the harbour. However, reportedly, the pilot did test the main engine astern on two occasions: once prior to entering Burlington Canal and again prior to the final approach to the slip. It seems that the OOW might have not logged some engine movements prior to the berthing manoeuvres. When the vessel was nearly alongside the wharf, the engine was ordered astern at 2334, but there was no engine response. The starboard anchor was dropped at 2335, but the vessel struck the dock at 2339; thus, the vessel covered 380 m of the slip length in about 7 minutes. Her final approach speed was therefore approximately 1.7 knot or 0.90 m/sec.

At 0600, May 15, the "NORTHERN CHERRY" was eventually towed alongside her assigned berth with the assistance of the tugs and by heaving on the ship's mooring lines.

8. Use of Tugs

Throughout the berthing manoeuvres, both "STORMONT" and "GLENEVIS" were positioned alongside fore and aft respectively of the "NORTHERN CHERRY". Neither of them was made fast to the vessel and thus could not be called upon to assist in slowing and controlling the forward movement of the vessel.

9. Malfunction of the Main Engine Automatic Air-Starting Valve

After the accident it was found that an automatic valve in the main engine air starting system was not functionning at the depleted air pressure of 16 kg/cm^2. This was replaced with a spare, previously used, valve; the compressors were operated and the pressure in the air receivers restored to 21 kg/cm^2. The main engine was then restarted at 0130.

The vessel's forward weight was on the damaged bow which, in turn, was hung up on the wharf and many engine orders were given between 0130 and 0538 in attempts to free the vessel. At this time the starting air pressure available had been reduced to 16 kg/cm^2, and once again the main engine could not be restarted.

The operating range of the automatic air starting valve was reportedly 14.5 kg/cm^2 to 21 kg/cm^2, however no

internal examination of the original valve was carried out as it was considered by the ship's engineers that rust and moisture in the air starting system had caused the malfunctions at the relatively low air pressure, and that in future they would ensure that higher air pressure would be maintained. Also, the accuracy of the gauge was not checked and consequently its accuracy is not known.

10. Damage to Vessel

An external inspection at the bow of the vessel while she was discharging cargo at pier 14 showed the following:

(1) Damage to the stem and shell plating in way of the forepeak tank extending vertically from the forefoot up to the 8.80 m draught mark, and horizontally aft of the stem to frame 119, (approximately 2.40 m). The initial point of contact appeared to have occurred at the junction of the rolled steel stem plate and the solid round steel stem bar.

(2) Because of the shell damage the forepeak tank was pierced and flooded up to the trimmed waterline; however as no flooding was detected in the forward hold or double bottom tanks, the collision bulkhead at frame 116 appeared to have remained intact.

11. Repairs

The "NORTHERN CHERRY" commenced discharging her cargo on May 15, and completed discharging cargo on May 28. Repairs to the bow damage and to the air pressure starting system were carried out to the satisfaction of the Canadian Coast Guard, the owner's representative and the master. The vessel departed from Hamilton on the evening of May 28, 1986, bound for Duluth, Minnesota.

12. Subsequent Malfunction of Main Engine

At 1605, May 31, 1986, VTS Sarnia reported that the center was advised by the tug "NEBRASKA" that she was en route to assist the Panamanian vessel "NORTHERN CHERRY" that was having engine trouble and was anchored in the Detroit river at Ballard Reef, channel buoy 76 D.

At 1645, May 31, the "NORTHERN CHERRY" advised VTS Sarnia that she was underway under her own power and no assistance was required. The vessel was reported leaving the Sarnia control zone at 2357, May 31, 1986.

It seemed that the vessel continued to experience engine trouble after the Hamilton striking.

13. Reporting of the Casualty

After the incident, the pilot left the vessel and neither he nor the master reported it directly to any of the required Canadian authorities. The American pilot was not aware of the Canadian Shipping Casualties Reporting Regulations. However, upon advice from the agents, the master reported this incident to the local Canadian authorities, later that same morning.

14. Qualification and Experience

The master holds a Panamanian Certificate of Competency as Master of a Foreign Going Steamship issued in 1984. He has 14 years experience in the merchant marine, more than two of which were as ship's master. This was his second voyage to Hamilton but he relied mainly on the local knowledge of the pilot for the handling of the vessel.

The chief officer holds a Korean Certificate of Competency as Master of a Foreign Going Steamship issued in 1985. He has 10 years experience in the merchant marine, 5 of which were as a deep-sea officer. He has been on board the "NORTHERN CHERRY" for 7 months. At the time of the incident, he was at the forecastle station and dropped the starboard anchor immediately when the order was received from the bridge.

The chief engineer is the holder of a Panamanian Certificate as 1st Class Motor Engineer issued in 1982. He has 16 years experience in the merchant marine, has been chief engineer since 1979, and has served on board the "NORTHERN CHERRY" for 7 months.

At the time of the incident, the chief engineer, the first engineer, the third engineer and an oiler were in the engine-room. The first engineer was manoeuvring the main engine. He is the holder of a Korean Certificate as 1st Class Motor Engineer issued in 1981. He has 6 years experience as a seagoing engineer and has been on board this vessel for 7 months.

The pilot holds a United States first class pilot licence issued in 1984. He has been a pilot on Lake Ontario since October 1984, and has made about 30 trips to Hamilton, 4 of which were to bring a vessel into these same slips in the harbour.

Findings

The Panamanian vessel "NORTHERN CHERRY" struck the end of the slip in Hamilton harbour, with heavy damage to her bow and minor damage to the wall, because the main engine would not go astern, due to an improperly operating air-start valve.

It would appear that the following factors contributed to the casualty:

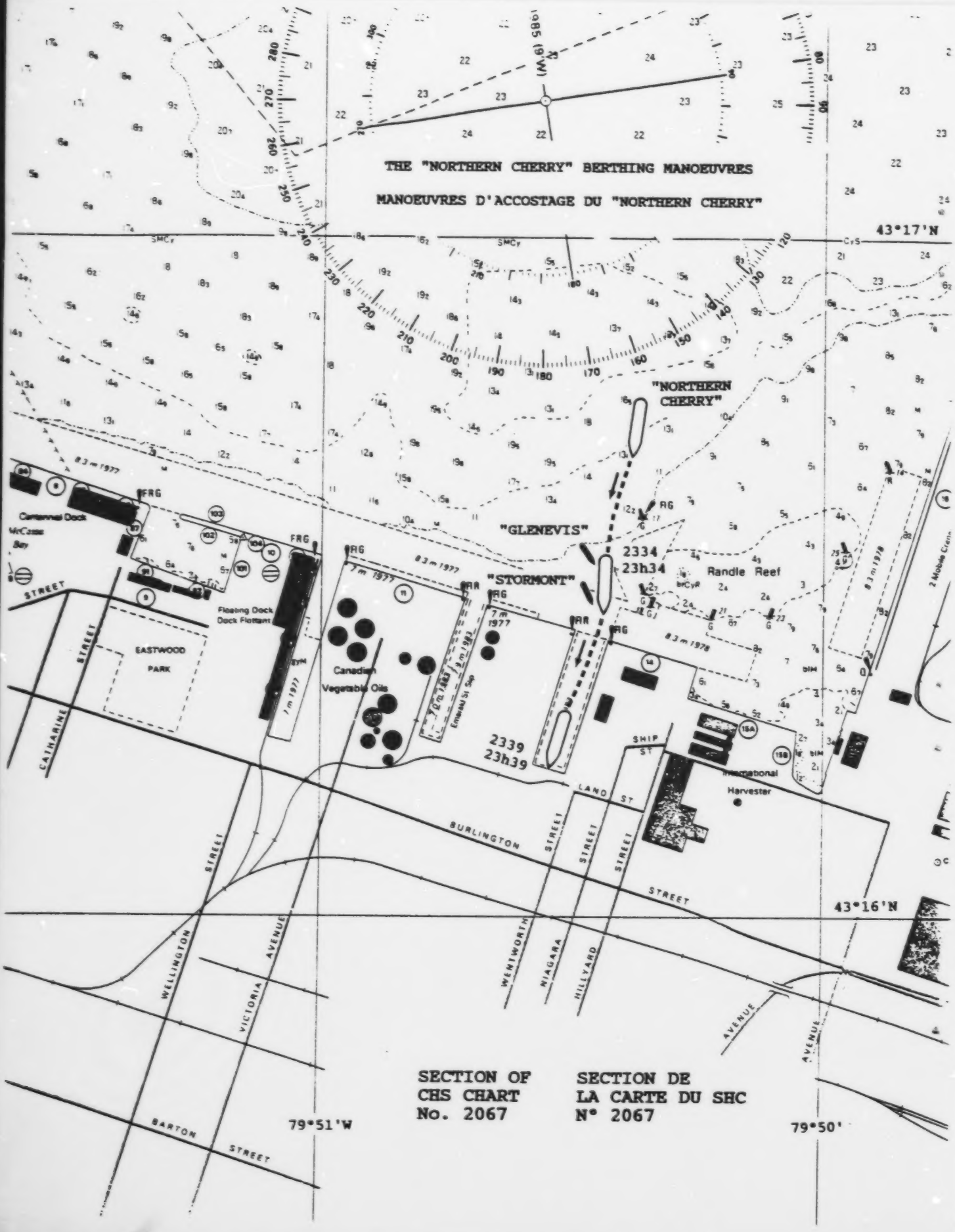
- the malfunction of the air-start valve, due to the rust and moisture in the air starting system;
- air, for the air start system, was at its lower pressure level; and
- the failure of the engine to start was unexpected.

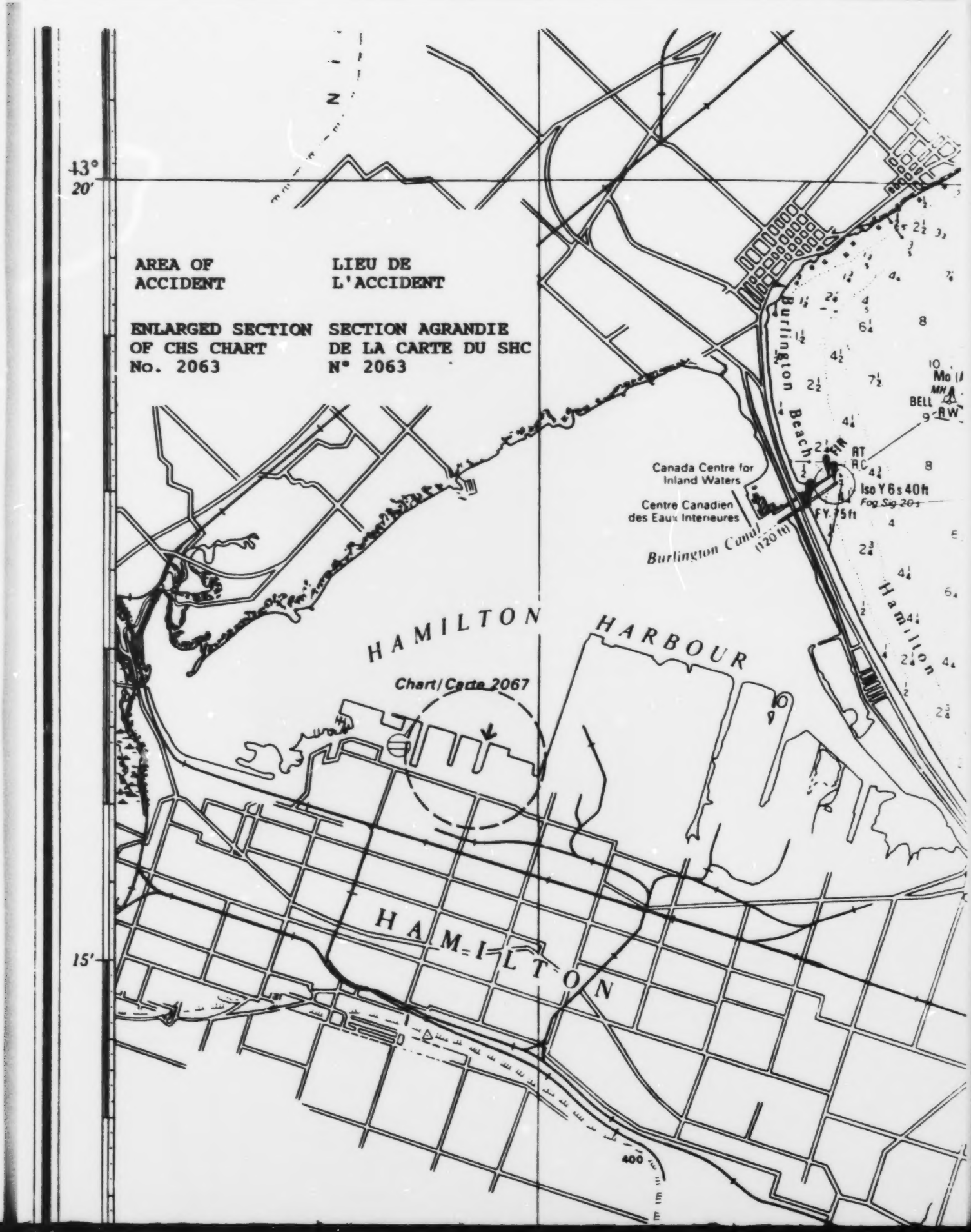
Other Findings

The traditional method in Hamilton harbour of not using securing lines to the tugs preventing the tugs from being of assistance in arresting the vessel's forward movement.

During her present voyage through the Great Lakes, the vessel is known to have had at least one other mechanical problem.

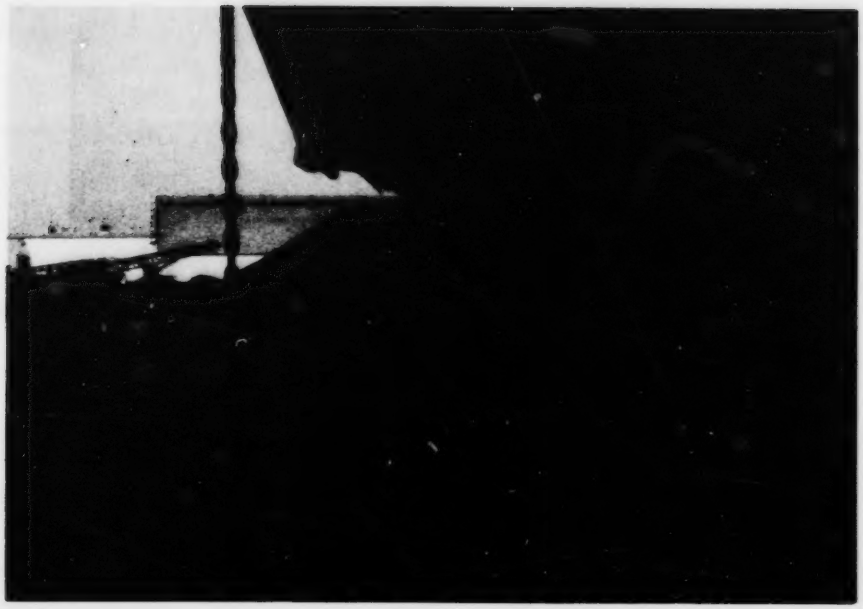
OTTAWA, ONTARIO
OCTOBER, 1986.


THE "NORTHERN CHERRY" BERTHING MANOEUVRES
MANOEUVRES D'ACCOSTAGE DU "NORTHERN CHERRY"
43°17'N
43°16'N
79°51'W
79°50'
"NORTHERN CHERRY"
"GLENEVIS"
"STORMONT"
2334
23h34
2339
23h39
Randle Reef
Canadian Vegetable Oils
Floating Dock
Dock Flottant
EASTWOOD PARK
Canonmill Dock
McCabe Bay
SHIP ST
LAND ST
BURLINGTON STREET
CATHARINE STREET
WELLINGTON STREET
VICTORIA AVENUE
WENTWORTH STREET
NIAGARA STREET
HILLYARD STREET
BARTON STREET
SECTION OF CHS CHART No. 2067
SECTION DE LA CARTE DU SHC N° 2067


AREA OF ACCIDENT
LIEU DE L'ACCIDENT
ENLARGED SECTION OF CHS CHART No. 2063
SECTION AGRANDIE DE LA CARTE DU SHC N° 2063
43° 20'
15'
Canada Centre for Inland Waters
Centre Canadien des Eaux Interieures
Burlington Canal (120 m)
Burlington Beach
Hamilton
HAMILTON HARBOUR
HAMILTON
Chart/Carte 2067
Iso Y 6s 40ft
Fog Sig 20s
F.Y. 75ft
BELL
400

The "NORTHERN CHERRY" at pier 14, Hamilton Harbour, May 16, 1986

Le "NORTHERN CHERRY" à l'appontement 14 dans le port de Hamilton le 16 mai 1986



"NORTHERN CHERRY", bow damage

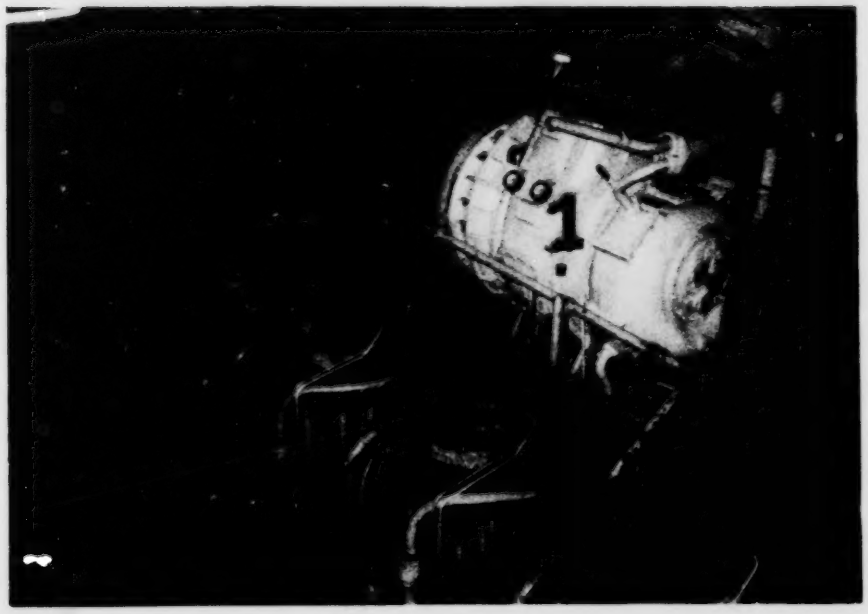
Avaries à la proue du "NORTHERN CHERRY"

(1) Main engine automatic air starting valve

(1) Soupape de lancement automatique de la machine principale

Engine control room

Salle de commande des machines



Main engine 6 cylinders "Sulzer", type 6 RND 68
(1) turbo charger

Machine principale Sulzer de 6 cylindres, type 6 RND 68
(1) turbo compresseur